REPORT OF THE PRE-APPRAISAL TEAM FOR WATERSHED DEVELOPMENT PROJECT IN WESTERN MADHYA PRADESH WITH DANIDA ASSISTANCE

DECEMBER, 1992

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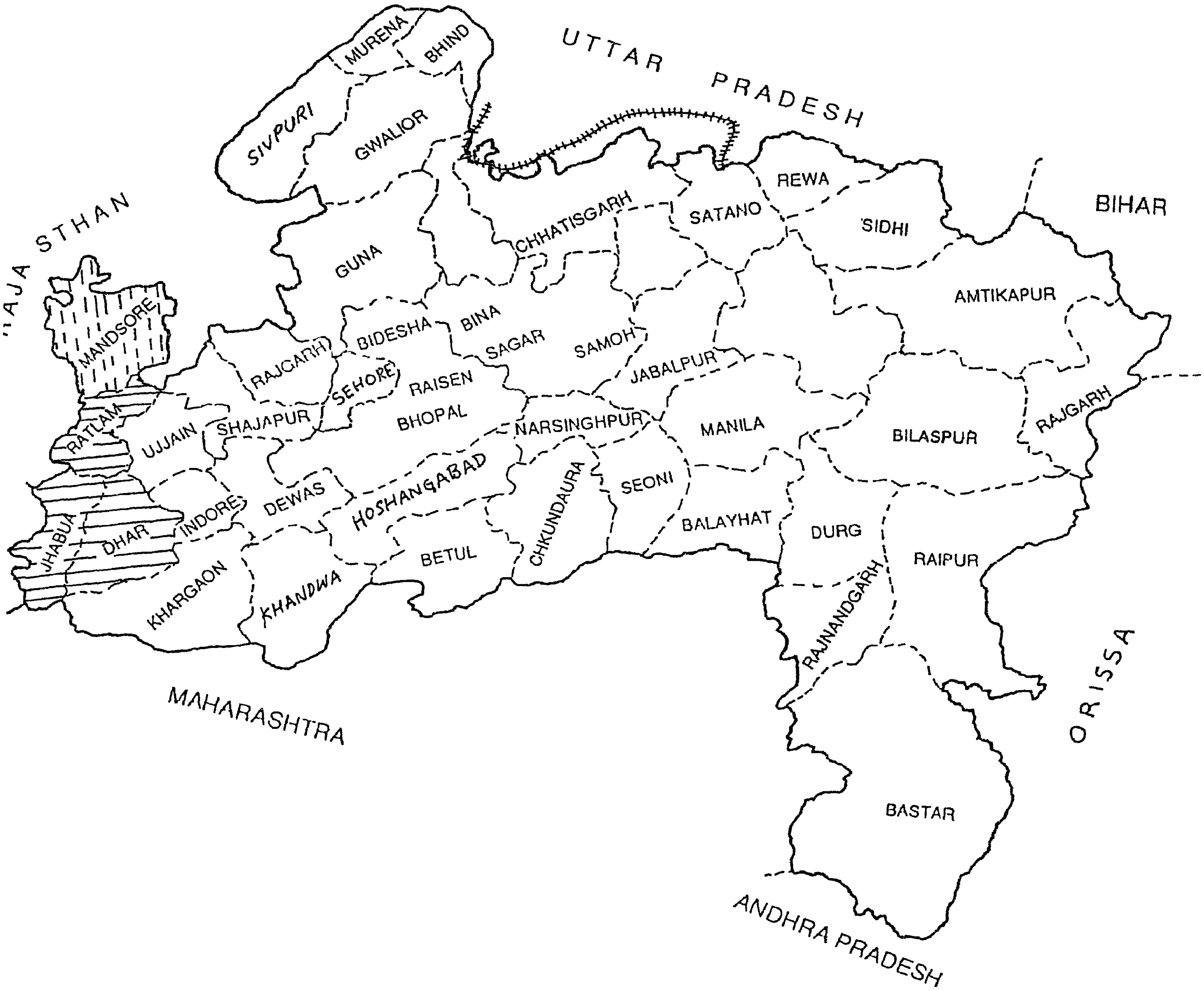
Integrated Horticulature Development Programme (Chart No. ..1..... AHS)

MAP OF MADHYA PRADESH
Indicating
Proposed project Areas.

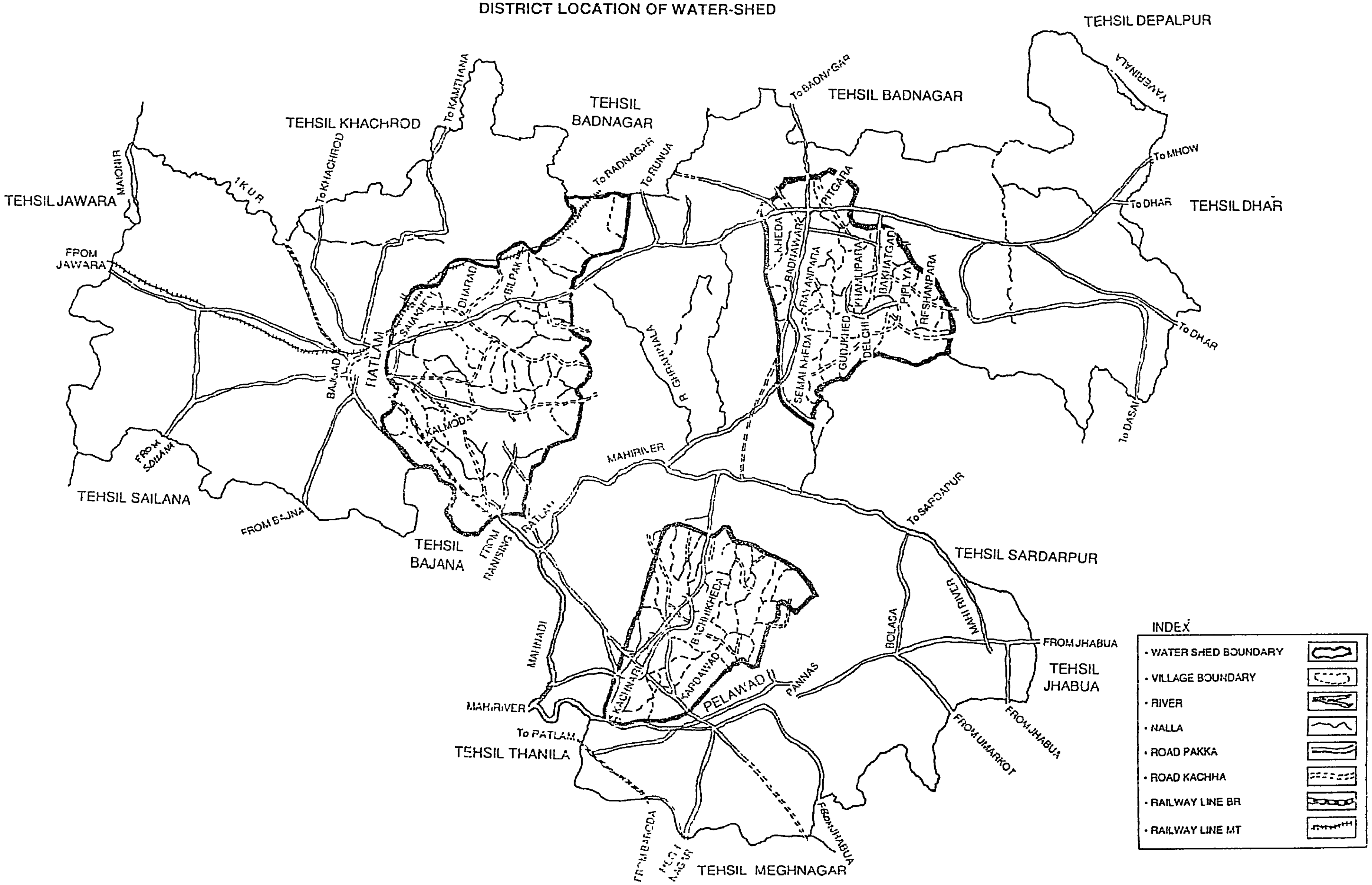


Index.

Name of Watershed	Geographical Area
▥ • IDAR W/S	28907 Ha
▤ • UNDWAKHAL W/S • SARANGI W/S • BADNAWAR W/S	32494 20 HA 19823.65 HA 20569.212 HA

Integrated Horticulature Development Programme (Chart No .2... AHS)

COMPREHENSIVE WATER SHED DEVELOPMENT PROJECT
IN WESTERN MADHYA PRADESH
DISTRICT LOCATION OF WATER-SHED



LOGICAL FRAME WORK

DEVELOPMENT OBJECTIVES	Sustainable Use of Natural Resources with - Improved Land Resources - Improved Water Resources - Integrated Efficient Management			
IMMEDIATE OBJECTIVES	- Sustainable Land Use Systems Adopted Soil Erosion Reduced in Project Area - Increased Agricultural Production Achieved Small and Marginal Farmers' Income Increased - Landless and below poverty line peoples' Income Improved			
OUT - PUTS	Improved Land Conditions	Improved Water Resources	Improved Agricultural Production	Effective and Efficient Extension System Built Up
ACTIVITIES	- To regenerate vegetative cover by appropriate Agricultural Practices - To manage run-off by suitable water holding structures - To control grazing by involving local people - To encourage agricultural practices to * Reduce Soil Nutrient Loss * Ensure Nutrient Balance * Ensure Moisture Conservation * Practice Dryland Farming Technology	- To improve Water Infilteration by * Undertaking Vegetative Measures * Impounding Rain Water in Ponds; Tanks;Sunken Wells; Water Structures - To Maintain Ground Water Balance by Controlled Exploitation of Water Resources by Tube Wells	- To practice Watershed Farming * Moisture Control * Nutrient Balance * Run-off Control - To practice Improved Dryland Farming Technology * Crop Rotation * Inter Cropping - Legumes - To encourage Development of * Horticultural Crops * Fuel/Fodder Crops - To encourage Mixed Farming Poultry Dairy;Cottage Industry;Grass Cutting - To introduce activities requiring farmers' presence in the village * Double Cropping * Tending Hort Crops etc. - To Recycle Organic Wastes - To use Proper Implements	- To Involve Beneficiaries Particularly Target Groups of Small and Marginal Farmers in Design and Implementation of Project Activities - To create Multi-Disciplinary Extn. Team to Enable Broad-based and Intensive Transfer of Technology Regularly in Support of RAEOs - To Train Different Levels of Extension Staff in Watershed Technology and Community Participation - To undertake Applied Research on local Grasses and Hedges - Each Extension functionary to adopt a village - Special Attention to Women
INPUTS	- Extension - Training/Demonstration - Peoples' Participation - Village based Training Workshops	- Extension - Training/Demonstration - Public Policy	- Extension - Training/Demonstration - Appropriate Seeds/inputs - Appropriate Tools/Implements - Credit	- Full Complement of Staff - exclusively for Project Work - Evaluation System for Staff Honorarium/Rewards

I BACKGROUND

1.1 Introduction

1.1.1 A DANIDA mission comprising of M/s Harbans Singh- Agronomist, (Team Leader), O.N. Kaul- Forestry Expert, S.S.Ahluwalia- Institutional Expert, Ms. Parbeen Singh- Socio-economist, Dr. S.L. Seth- Additional Commissioner, and S.B. Saxena, Government of India (GOI), Ministry of Agriculture and Mr. Jens Rasmussen, Royal Danish Embassy, visited the project areas in Madhya Pradesh (MP) from October 21 to November 6, 1992. While the first four members of the team spent the entire period in the project area, the remaining three members participated only in part.

1.1.2 The mission visited the proposed project areas in the districts of Ratlam, Jhabua and Dhar. Total area proposed for the project is 59,801 ha. The time at the disposal of the mission was insufficient. However, efforts were made to make good this constraint by increasing the working hours to about 10-15 per day. The proposals submitted by the Government of Madhya Pradesh (GOMP) were examined at the spot. At least two senior officers of the Department of Agriculture remained with the mission throughout. These included M/s G.P. Saxena, and B.K. Srivastava, Joint Directors of Agriculture, Indore and Bhopal respectively. The itinerary followed by the mission is at Annexure I. Local staff comprising of the Deputy

Directors of Agriculture and other field officers met the mission in their respective jurisdictions. The mission also met the Collectors of Ratlam and Jhabua districts, as also the officers of the departments of Animal Husbandry, Dairy Development, Poultry, Forestry, Fisheries and other concerned line departments. The mission had also detailed discussions with a large number of growers and other sections of the population including men and women, tribals, scheduled castes and landless labourers, and Non-Governmental Organisations (NGOs), so as to understand the existing economic, socio-economic and other conditions of the people of this area.

1.1.3 At the beginning of the tour, the mission met the representatives of the GOMP under the Chairmanship of Mr. S. Satyam, Agricultural Production Commissioner (APC), Ms. Alka Sirohi, Secretary (Agriculture). Mr. J.P. Patel, Director of Agriculture alongwith some of his officers also participated in the meeting. The APC explained the salient features of the proposal submitted by GOMP and a gist of discussions held is placed at Annexure II. The mission had a debriefing session with the officers of the GOMP which was chaired by Ms. Alka Sirohi. The Mission had also the privilege of meeting Mr. Sunderlal Patwa, Chief Minister (CM) on the morning of November 5, 1992 and a gist of the discussions held is at Annexure III. A summary of the impressions, findings and broad recommendations of the mission, a rough draft of which was given to Ms. Sirohi, is placed at Annexure IV. The mission returned to Delhi on the night of November 6. Some important information on the project was received by the end of November.

1.4 The Hon'ble CM, APC, and Secretary (Agriculture), GOMP, laid strong emphasis for the inclusion of Mandsaur District to be covered under DANIDA assistance and provision for construction of check-dams. Collector, Ratlam District also strongly advocated efficient utilization of water for irrigation by storing the same with the help of check-dams etc. Mandsaur District was part of the proposal of the GOMP but was excluded from the terms of reference of the present mission. However, the mission feels and recommends that the request of the GOMP should be considered. The mission does not feel that any matter of principle is involved in it. It appears to be simply a matter of extended coverage. If this pleases and helps the State Government and its people, it would be a great plus point for the success of the project. A great deal of emphasis is laid on the beneficiary participation. This may perhaps be the first step in this direction. We are sure this will send excellent signals for the benefit of both the sides. We also honestly feel that it is too small a matter to ignore the request of the CM and the APC.

1.2 General Features - Madhya Pradesh

1.2.1 Madhya Pradesh is situated in the heart of the country. Total geographical area of the State is 443,446 sq km with a population of 52 million. The density of population per sq km is 118 as compared to all-India figure of 216. However, the State has some problems leading to agricultural production being much below its potential. The total area under cultivation is 22.155 million ha of which only 16.92% or 3.74 million ha (Mha) is irrigated, and the rest (18.415 million ha) is rainfed.

1.2.2 Average per ha foodgrain production in the State is 1,004 kg as against the national average of 1,349 kg. Per capita income in the State is Rs. 2,100/- as compared to the national average of Rs. 3,200. Average annual rainfall is 1,142 mm; literacy is only 27.9% and population below poverty line 46.2%.

1.2.3 An interesting feature of the agricultural situation in MP is that 61% of the total foodgrain production of the State is derived from rainfed farming. Naturally, the contribution of rainfed farming to the economy of the State is quite significant and requires special attention. Madhya Pradesh, being the biggest state in the country area-wise, has a great potential for growth. The project under consideration lays considerable stress on dryland farming and hence is a step in the right direction.

II CONTEXT

2.1 Broad Description of the Sector

2.1.1 The Watershed Development Project in Western MP covering a treatable area of about 60,840 ha in three districts of Ratlam (Undwa Khal - 26,202 ha), Dhar (Badnawar - 17,652 ha) and Jhabua (Sarangi - 16,986 ha) has been proposed for DANIDA Assistance by the GOMP. The rough costs/investments estimated by the State Government are Rs. 234.979 million. After discussions and initial field visit by an earlier two member DANIDA Team (February 17 to 19, 1992) the proposal was considered suitable for mounting pre-appraisal mission for working out more details.

2.1.2 The Watershed Development concept in India is not new. The National Watershed Development Project for Rainfed Areas (NWDPRA) is a major thrust programme launched by the Department of Agriculture (DOA) during the Eight Plan as a 100% GOI financed programme spread all over the country. World Bank assisted watershed development projects are also in operation in several states since 1984. As a result thereof, several lessons have been learnt and technologies improved upon.

2.1.3 Based on the experience gained so far, the GOMP has proposed for adoption of cheap, replicable, and sustainable technologies for the implementation of the project. This is why average investment is about Rs.

3,929 or say Rs. 4,000 per ha according to the proposals of the GOMP. The proposals cover the treatment of the entire area with new watershed development technology. Even though the watershed development programmes are underway for long, it is for the first time that such a large area is proposed to be treated. Earlier, all programs were by and large models for demonstrating the effectiveness of the treatments. Treatments of about 20,000 ha in one compact block and about 60,000 ha in adjoining three districts will be an excellent demonstration of impact of treatments on the economy, environment, ecology and equity of the area with a population of about 108,156. A map of the project areas in the three districts of Ratlam, Dhar and Jhabua is at Chart I. For providing a clear understanding of the area, the position of the project area in MP is presented in Chart II.

2.2 Technology Appropriateness

2.2.1 The technology of moisture conservation in situ including vegetative measures suggested in the GOMP proposals is correct. This is also simple, cheap, sustainable and dynamic. Once its effectiveness is demonstrated, it can be taken up by the farmers themselves on a large scale. Its maintenance cost is negligible. However, the field application of technology will depend upon location specific conditions determined by thorough survey of the area by the experts. On the whole, the technology, methodology and measures suggested in the proposals are sound.

2.3 Present and Suggested Land Use Pattern

2.3.1 Presently, majority of the area is under plough even if it has more slope than required. Similarly, some areas which are almost wasteland are also cultivated. Many a small patches of ploughed areas are in the center of wastelands or grasslands. Areas termed as forests have no trees at all. The wastelands are either bare with exposed rocks or have a very poor grass because of continuous grazing and trampling. All this is leading to excessive erosion and depletion of soil fertility. The project should ensure that the land is used according to its slope and capability. All slopey (slopes higher than 20%) lands should not be used for cultivation. Similarly, soils with very poor fertility or shallow depths be put to alternative use. All such soils and wastelands be converted into grasslands (grass and legume mixture) fuel and fodder plantations and forest tree plantations which could be of economic benefit to the people. Tree crops (fruits) should be encouraged in such lands wherever possible.

2.3.2 The future land use pattern can only be determined after thorough survey. Mini-or micro-watershed planning would be necessary. Planning of wastelands should be given priority to the requirements of the local population for fuel, fodder and other such needs. Higher level planning should only serve as a guideline. Most people are still at great distance from the plans for their economic uplift psychologically and geographically. Thus, the project must initiate and depend upon location specific planning. Sophisticated economics has little or no relevance to extreme poverty conditions and problems of this area. We must have unshakable belief in people.

2.4 Watershed Development Strategy in India

2.4.1 Watershed development strategy in India has an integrated approach to the treatment of all categories of land within the watershed. It includes (i) arable lands, (ii) non-arable lands (including private, community and Government owned), and (iii) the network of drainage lines. All the three categories are interlinked and interdependent and are treated as one organic geo-hydrological entity for project planning and implementation. Thus it is a complete integrated approach and strategy. The proposal submitted by the GOMP is in line with the broad approach strategy of GOI set forth in the NWDPRA.

2.5 Prior or Ongoing Assistance

2.5.1 DANIDA is financing projects in Orissa and Tamil Nadu in the Watershed sector. However, the present project

major objectives.

2.5.2 The World Bank assisted watershed development project started in 1984 in four states of Punjab (Kandi), Madhya Pradesh (Parua Nala), Maharashtra (Akola) and Karnataka. The approach, strategy and technologies were changed during mid-term review when special emphasis was laid on cheap, sustainable, replicable and dynamic technologies of water and soil conservation in situ as against the earlier emphasis largely on static engineering works. Based on the lessons learnt and effectiveness of the emerging technologies of moisture conservation in situ, World Bank aided watershed development projects were initiated in the three hill states of Jammu & Kashmir, Himachal Pradesh and Punjab (hill areas) and some of the plain states.

2.5.3 The investments in the plain and hill states watershed development projects were proposed at U.S. $ 55 million and 75 million respectively.

2.5.4 GOMP has a number of areas covered under the NWDPRA. So far as foreign assisted programmes of similar nature are concerned, the State Government has an ongoing project on 'Rainfed Farming' assisted by World Bank on Parua Nala.

2.6 Parua Nala Project

2.6.1 Approximate cost of the World Bank assisted project is Rs. 194.77 million. Project was started in June 1984 and is scheduled to be completed in December 1994. Total area to be covered under the project is 72,624 ha in the districts of Bhopal and Sihore.

2.6.2 Project activities include development and adoption of technology for increasing and stabilizing crop and forage yields and production of fuelwood and fodder; almost the same objectives as are proposed for the DANIDA project under consideration.

2.6.3 The World bank assisted project follows an integrated watershed development approach. The activities undertaken include crop production, soil conservation measures, development of grazing lands, afforestation with fuel and fodder species etc.

2.6.4 One of the achievements of the Parua Nala Project so far is that cropping intensity has been raised to 160% from an initial level of 108%.

2.6.5 Because of the commonalty of project objectives, project strategy etc. and because of the success achieved in the Parua Nala Project, it is suggested that a study should be undertaken on the Parua Nala Project. None of these projects are in operation in the proposed project area. There will, therefore, be no duplication or repetition in the proposed project area.

2.7 Socio-economic Context

2.7.1 The project area comprising of the three watersheds in Western MP is one of the most backward areas and presents lot of scope for development. Soil conditions are poor; a lot of soil degradation has already taken place; large patches of land have turned into barren wastelands. Irrigation availability being extremely limited, agricultural activity is low-yielding. During periods of stress, many of the farmers and landless labourers migrate to adjoining areas for employment. Following figures are relevant:

Particulars	MP	Undwa Khal Watershed (Ratlam)	Badnawar Watershed (Dhar)	Sarangi Watershed (Jhabua)
Total geographical area	44.3 (Mha)	32494 (ha)	20569 (ha)	19823 (ha)
Net cultivated area	191.426 (Mha)	16414 (ha)	13507 (ha)	11613 (ha)
Unculturable wasteland	2.208 (Mha)	3287 (ha)	276 (ha)	2476 (ha)
Population	52 (million)	34785	49726	23645
Landless labourers	NA	1949	7247	4533
Population below poverty line	46.2%	53%	70%	79%

The presence of a big chunk of landless labourers and small and marginal farmers in each of the blocks necessitates certain measures to check their migratory habits and to ameliorate their social and economic conditions.

2.8 Institutional Framework for the Sector:

2.8.1 Being backward, the project area lacks institutional arrangements for training/demonstration. Indian Council of Agricultural Research (ICAR) runs a Krishi Vigyan Kendra (KVK) at Jhabua. This is the only place available at present, within the project area, for training/demonstration; otherwise the field staff has to go to the College of Agriculture at Ujjain for training purposes. However, two extremely good Institutions, both located at Indore, could also be involved with the proposed project and could form the nucleus of training for project staff and also of the villagers. These two Institutions are: (i) College of agriculture, Jawaharlal Nehru Krishi Vishwvidyalaya (Agriculture University) Indore, and (ii) Kasturba Gram krishi Kshetra, Indore. College of Agriculture, Indore conducts its own experiments on appropriate strategies of dryland farming in Hingonia Watershed of River Gambhir. Their experience could be of immense use to the proposed project.

III PROJECT JUSTIFICATION

3.1 Present Situation, Problems and Constraints

3.1.1 The three sub-watersheds in the districts of Ratlam, Dhar and Jhabua have a population of 108,156. There are in all 17,799 farming families and 13,729 landless labourers. Out of the total number of 17,799 holdings, 5,135 are small, 6,357 marginal and 6,307 others. The land use statistics, and other relevant information is given in Annexures V to IX.

3.1.2 The topography of the three districts varies. Jhabua has much more broken topography than the other two districts. The average rainfall is 945 mm for Ratlam; 846 mm for Dhar and 820 mm for Jhabua . Most of the rainfall is confined to monsoon months of July to September. Because of the slopes, absence of vegetative cover and any other worthwhile preventive measures, most of the rainfall goes waste as runoff causing erosion and temporary floods. Thus both the basic natural resources of soil and water are lost. It is roughly estimated that while soil loss is between 3 to 6 tonnes per ha, about 80% of the precious water received in the form of rainfall is lost. With this also goes soil nutrition and fertility. No wonder, therefore, that the productivity is low and more and more areas are added to the category of unproductive, uneconomic lands and wastelands. The holdings are splitting from generation to generation and a large percentage is becoming uneconomic.

3.1.3 Agriculture is mainly confined to mono-cropping system; largely the kharif crop. The cropping intensity is about 115%, which means only 15% of the area is double cropped. The average area irrigated is again about 15% (13.25% in Ratlam, 16.24% in Dhar and 16.96% in Jhabua). Thus rabi crop based on moisture conservation (of monsoon rains) is limited to a very small extent.

3.2 Water Resources

3.2.1 The first priority of the farmers, extension workers and even administrators is the creation of additional sources of irrigation. They have very little concept or understanding of the immense potential for the technology of moisture conservation in situ. When reminded, every one gets aware of the serious ground water situation. In the entire area the ground water is at its maximum at the end of monsoon (September). It starts going down from November onwards and is at its lowest level before the onset of rains next year. Generally none or very little irrigation water is available in March-April and May-June; so much so that there is great scarcity even in hand pumps installed by GOMP. Most of the pumps go dry and wherever water is available it is in small quantity and at intervals. There are, therefore, queues of water carriers. Generally the water is stored in hard rocks and their cavities. There are no aquifers in the region. It is , therefore, evident that the mainstay of the people is going to be rainfed agriculture.

3.2.2 The area as a whole is seriously degraded and the process of degradation continues. Forests have almost been depleted. Forest area (as on record) is 5,400 ha comprising of 5,276 ha in Ratlam and 124 ha in Jhabua. There is no recorded forest in Dhar watershed area (Annexure V). The fodder and fuel resources are also scarce. Even wastelands are becoming progressively barren with continued overexploitation of fuel and fodder resources.

3.3 Migration

3.3.1 Mostly mono-cropping system and low productivity have affected the economy of the entire section of the people. The opportunities for employment are limited to crop season which begins in June and ends in october with the harvest of soyabean. There is serious underemployment even amongst the large farming families. The situation is much worse in case of small and marginal farmers. They have to work on other farms. The position of landless population is not only worst but also pathetic. The increase in population is adding to the problem.

3.4 Overexploitation

3.4.1 Exploitation is directly related to poverty (most unfortunately). The small and marginal farmers produce food grains enough for 4-6 months in a year. As such they are unable to keep the seed for the next crop which is purchased, from the local dealer,on the condition that it will be paid back in double the quantity after the harvest. Consequently, one cannot choose or select varieties and other inputs, at the time of sowing, under such conditions.

3.5 Socio-economic Condition and Women

3.5.1 The socio-economic condition is deteriorating, more so of the women belonging to weaker sections. They contribute about 60% of labour force in agriculture in addition to about 100% in fuel and fodder, water collection and household chores. In spite of this they do not have any say in decision making. Whatever a woman earns is mainly spent on the whole family. The woman in the house is the last to eat and remains hungry if there is shortage of food. On the otherhand if the man is the earning hand, usually his first priority is to spend upon himself and take the balance for the family. There is very limited or no participation of the people in welfare works/projects.

3.6 Summary of Problems and Constraints

3.6.1 Main problems and constraints are summarized below as a bird's eye view.

- Low production of all land based activities.
- Poor quality production.

- Fluctuating or unstable production from season to season or year to year.
- Low returns.
- Extreme under-employment and unemployment situation.
- Substantial migration of population and cattle.
- Serious erosion, degradation and depletion of land, water, environmental and ecological resources.
- Extreme shortage of fuel and fodder resources.
- Extreme poverty and socio-economic backwardness of a good part of population.
- Over exploitation and socially low status of women.
- Lack of encouragement or incentives for peoples' participation. The role of NGOs is unfortunately insignificant if not totally absent.

3.6.2 The problems and constraints mentioned above have to be taken care of. DANIDA project is expected to be effective in removing these constraints.

3.7 Expected End of the Project Situation

3.7.1 The mission has concluded that the project proposals submitted by the GOMP are feasible. These will, however, require suitable amendments, changes and additions to achieve the objectives. The technologies for application and specially suited for these areas are available. The GOI and GOMP have sufficient experience to implement such a project.

3.7.2 Successful implementation of the project broadly set forth in this document will resolve and overcome the problems and constraints mentioned in sub para 3.6.1. Ultimately, the project will lead to the following results.

- Reversal of the process of degradation of land resources (soil), environment and ecology.
- Better and efficient utilisation of soil and water resources through the application of technology for moisture conservation *in situ*.
- Increase in cropping intensity from the present level of 115% to 160% by introducing double crops.
- Improvement in income by about 150% to 175% in totality from the resources as a whole.
- Improvement of employment by about 50% of the present level.
- Beneficiary participation and improvement of socio-economic status of poorer sections in general and women in particular.
- Meet the full requirements of fuel and fodder of each village.
- Improvement of hygiene and health of population of human beings and cattle.
- Creation of self confidence amongst people.
- Improvement of ground water resources.
- Last but not the least, the demonstrative impact of the success story and working as catalytic for large scale proliferation (and coverage) of such projects.

3.8 Target Beneficiaries

3.8.1 The first priority target group will be the people below the poverty line, landless families, small and marginal farmers.

3.8.2 Whereas the main thrust will be on the category of the people mentioned in para 3.8.1, the other categories will indirectly benefit from the project activities. For instance, the entire land will have to be treated on the basis of mini or micro watershed. No patches will be left untreated irrespective of the ownership. The entire population will take advantage of the application of new technologies. The production in the entire area will increase and thus will create additional employment opportunities. The whole of the project area being backward, it is proposed to follow an area approach strategy. Accordingly, various strategies proposed under the project are aimed at improving soil conditions and water retaining capabilities of the soil. As such, the beneficiaries will be the residents of the whole area, consisting of all the farmers. Details of all the beneficiary farmers are :

	Undwakhal	Badnawar	Sarangi	Total
Marginal	2,762	2,745	850	6,357
Small	2,396	1,988	751	5,135
Big	1,655	3,890	762	6,307
Total	6,813	8,623	2,363	17,799

3.8.3 With increased agricultural production, it is estimated that more than 13,000 landless labourers will get additional income.

3.8.4 Treatment of entire land is advocated because small and marginal farmers own 1/3rd or less than 50% of the land resources. Such patches of about 33 to 50% of the total land if left untreated will not only continue to cause degradation but also defeat the purpose of an integrated watershed development approach and creation of employment opportunities.

3.8.5 It is understood that most of the incentives will be directed towards the main target group (para 3.8.1). Others will benefit from the improved technology and extension services. Similarly, if the irrigated areas get right technology of improved production per unit of water (which is scarce), then production, income and employment potential will increase substantially which will help the area as a whole. For instance, one ha under grapes will employ more than 1,500 mandays in a year as compared to 150 or so for ordinary crop. The shortage of labour has already been felt in grape growing and intensive vegetable growing areas particularly tomato. Thus if the current scale of migration is to be avoided, all possible steps will be required to be taken. Of course, these will be by and large technological.

3.9 Project Strategy

3.9.1 The project strategy will be broadly on the same lines as indicated in paras 2.1.2 and 2.1.3 above. There may be some deviations and changes if the location specific conditions so warrant. Infact, this strategy and approach in the project will keep into consideration the experience gained and lessons learnt from the ongoing watershed development works.

3.10 Creation of Model Units

3.10.1 The project implementation will be spread over 60,840 ha in the three districts. As is usual there will be success stories, not so successful and even disappointing aspects of the implementation and impact. The rate of improvement is also slow and blurs the totality of impact even to the inhabitants unlike irrigation projects. Such a large scale coverage under large number of components usually do not create an immediate impact on the population at large and visitors particularly when fast growth of population is forcing more and more people under poverty line.

3.10.2 It is proposed that some focal or model impact points or centers be developed at a few selected centrally located villages (say 3-4) in each watershed. The whole village will be saturated with the watershed development technologies which will include all the activities included in this project. The implementation will be undertaken at a fast pace so that the villages develop according to the project philosophy, objectives and strategy within three years or so. Every effort will be made by the project management to develop these centers as real models where impact would be visible even to a casual visitor and the units could be effectively used for demonstration of the impact of the watershed development efforts and training of all categories of people involved in the activities i.e. local population, extension workers, administration etc. Such centers will be used for field days as well. In otherwords these selected villages should become ideal models and nuclei for the concentrated development in the surrounding areas.

3.10.3 The development of the model villages will be done with the full and willing cooperation of the people. Infact, their will, partnership and motivation will be the main criteria for the selection of such villages. A village committee of all target groups will be associated right from the planning stage. It would appear that the project is theirs. Women will be given special consideration.

3.10.4 The development of model centers will not require much additional resources as it will only mean quick and concentrated implementation of components. However, there may be slight additional expenditure. Each village will have an official of the level of Agricultural Development Officer (ADO) incharge of the village. He will have two more members of the implementation committee (one man and one woman) who will be the main motivators representing the people. The Subject Matter Specialists (SMS) of the respective line departments will pay special attention to these model centers. The rest of the staff will be on the same pattern as the remaining project area. A token fund of Rs. 50,000 be provided tentatively for additional activities,if needed. However, exact estimates can only be framed after a thorough survey of the requirements. These may vary from village to village.

3.11 Institutional Arrangements

3.11.1 Presently land based activities are attended to by many agencies which include Departments of Agriculture; Forestry; Animal husbandry, Dairy and Poultry; Fisheries etc. Many other agencies like Welfare Department, Rural Development Department etc. are involved. The district level coordination is done by the Collector and at the state level mostly by the APC. The state Agriculture University is providing research back-up and technology support.

3.11.2 Although there is no horticulture nursery and seed production farm in the project area, the planting material is being supplied from outside the project area.

3.11.3 It is understood that the existing staff will continue to work in the project area. Additional staff will be provided under this project. Similarly, the nurseries for the multiplication of planting material will be set up. These arrangements are further discussed under Organization and Administration in chapter V.

3.12 Special Considerations

3.12.1 The project will follow an Area Approach System under which the relevant technology will be applied to the whole of the area. A participatory approach for development will be followed which will place a strong emphasis on a multi-disciplinary aspects of the project. Poorer sections of the society will need to be given special project support. A dedicated and committed team of extension personnel will need to be built up to carry across the message of the project to the beneficiaries.

3.13 Host Government's Support Capacity

3.13.1 This can be divided into two categories; technological and financial. GOI is fully aware and competent to handle the project in all its technological aspects. They are on very strong ground at this stage and are even capable of providing location specific technologies for integrated watershed development. The teams at the Central and State level are experienced and competent.

3.13.2 What is lacking is the inadequate financial resources. Even though the provisions in Central and State Sectors appear to be impressive, these do not touch even the tip of the iceberg because of the vast areas required to be treated in the country. India has 104.95 Mha under rainfed farming which require to be treated.

3.14 Reasons for Assistance from DANIDA

3.14.1 The most important reason is the treatment of the areas and improving the economic status of the poor and such projects are most important for the purpose. Thus any financial assistance to quicken the pace of watershed development is welcome. Another important reason is not only the reversal of land degradation but also the improvement of ecology and environment. This has a global connotation and impact. India is ready to march ahead very fast and its efforts are adequately supported by the developed countries. Greening of earth is a global problem and common heritage of the inhabitants of this world.

3.14.2 Denmark has vast experience and rich philosophy of ecology and environmental problems. Danish Government and the people understand the problems, impact and consequences much better than many other developed countries. As such Government and the people of Denmark share same philosophy and concern on such an important issue. Hence this request for assistance from Denmark.

IV THE PROJECT

4.1 Development Objectives

4.1.1 Some of the important objectives of this programme will be:

- Sustainable use of basic natural resources.
- Prevention of further degradation, upgradation of natural soil and water resources, improvement of overall productivity and optimal and equitable land use.
- Prevention of soil erosion and Conservation of water resources.
- Removal of regional and sectional imbalances in the economy within the State, districts and the watershed areas.
- Improvement of economy and employment.
- Effective coordination and linkages between various systems of land use, farming and diversification of agriculture.
- Meeting the requirements of food, fuel, fodder and generation of employment to the maximum possible extent.
- Ensure peoples' participation as a movement in their own interest through intensive education and motivation.

4.2 Immediate Development Objective(s)

4.2.1 The immediate objective will be to survey, investigate, plan and implement the land treatments so that further deterioration and degradation is checked and the process of reversal is started. This will be supported by the application of available technologies and resources for improved production and income from land and other sources. Immediate development objectives include :

- Improved moisture conservation.
- Increased agricultural production.
- Increased horticultural production.
- Increased fuel and fodder production.
- Additional employment generation.
- Better living and health standards.

4.3 Outputs

4.3.1 The major outputs of the project are expected to be :

- Improved land conditions.
- Improved water resources position
- Improved agricultural production.
- Effective and efficient extension system.
- Peoples' involvement and participation.

4.4 Project Activities (Outlines)

4.4.1 The final project activities and treatments will emerge only after detailed surveys and investigations are carried out on mini- or micro- watershed basis. Many treatments and their extent will depend upon location specific conditions. The treatments and application of technologies and package of inputs etc. will be reoriented, amended or changed as the local conditions of soil and moisture conservation improve. It will, therefore, be premature to determine or fix the activities or treatments at this stage. The implementation process will be flexible so that necessary corrections could be made as the project gets along. While close supervision and monitoring of project activities will provide enough indications for modifying the course of action, a detailed mid-term review will be necessary for changes, if any, required as a result of experience and new technologies available at that point of time.

4.4.2 Outlines of the activities envisaged at this stage are given below.

4.5 Land Treatment

4.5.1 All categories of land, i.e. cultivated, old fallows, wasteland (Government, community or private) and forest lands will be treated with appropriate technology. The basic and foundation treatment will be moisture-conservation *in situ* with vegetative hedges, treatment of drainage lines, prevention of water runoff and consequent soil erosion with the above steps, as far as possible, and supplemented by sunken water storage which will help in improvement of ground water.

4.5.2 Improvement of fuel and fodder resources so that the entire demand is met locally. This will require plantations of legume grass mixtures, fodder and fuel trees, their maintenance and protection. It will largely be done in wastelands.

4.6 Crop Husbandry

4.6.1 By far the largest part of the population depend upon crop husbandry in cultivated area. The production in crop lands is low; and employment not much significant leading to large scale migration of a substantial part of the population. The most important activity from the peoples' point of view will be to increase the cropping intensity from present level of 115% to 160% with corresponding increase (50%) in employment. At the same time, productivity per unit area will also be improved with package of technologies and incentives introduced, thereby raising income by 25% to 50% and employment by the same level. Double cropping will prevent migration. The sub-activities under this sector would be intensive technology input, production support services like fertilizer, seed and pesticide inputs, demonstration of package of technology on an appreciable scale to create an immediate visual impact and provision of incentives to deserving and select target groups. Crop husbandry will include crops whose residue is used as fuel (cotton, pigeonpea etc.). Besides ensuring timely supply of inputs the procurement of surplus produce will be ensured. Arrangements will be made for supply of seeds to poorer farmers through cooperatives or other alternative arrangements.

4.7 Rainfed Horticulture

4.7.1 Rainfed horticulture will receive special attention. This will comprise of the following sub-components.

a) Plantations in existing cultivated lands.

b) Plantations of suitable species in wastelands for allotment to the pre-determined target groups.

c) Budding *in situ* of the wild *ber* (*Zizyphus mauritiana*) which are in existence in large numbers with improved commercial cultivars.

d) Setting up of nurseries for propagation of high quality planting material.

e) Promoting vegetable cultivation.

Promotion of horticulture will help in generating more income and employment because these are labour intensive crops. About 10% of the area (about 6,000 ha) can be easily put under horticultural crops. The tree horticultural crops will help in improving the environment and ecology.

f) Plantations specially targeted for poorer sections will be developed by providing employment for plantation and maintenance. This can either be full or half (50%) employment guarantee scheme. These beneficiaries will be allotted one or two ha of land and will contribute their own labour for maintenance for which they will be paid partly in kind (foodgrain) and partly in cash, which may be Rs. 300 to Rs. 500 per month. This will sustain their interest and prevent migration of atleast part of the family in the initial stages. DANIDA and GOMP can decide the extent to which funds can be provided for plantations and labour. The mission recommends that the total cost may be funded with 50% subsidy and 50% returnable interest free credit. This will be recovered when the orchard starts giving profits.

g) Growers should also be provided an incentive of Rs. 6.00 per budded plant (ber), the present rate being only Rs. 4.00. This should be paid in three instalments and beneficiaries should be trained in budding and maintenance operations.

h) Rainfed horticulture technology will be applied in full. This will comprise of land treatment as explained earlier. The plantation will be hedge row plantation system on contour strips.

i) As most of the plantations will be in wastelands, grasses and legume mixtures will be developed for meeting the fodder requirements, in interspaces.

j) Areas will primarily be fenced with live hedge fences (Prosopis juliflora, Euphorbia etc) which are cheaper than barbed wire or trench-cum-mound fencing. Live hedge fences are more effective and can also provide fuel in emergency.

k) Improvement of existing orchards which are in poor condition would be necessary to demonstrate the value and impact of tree crops. This will consist of appropriate technology application and demonstration for rejuvenation. The cost will vary according to local conditions but ordinarily should not exceed Rs. 500 to Rs. 1,000 per ha. Total area to be treated may not be more than 500 ha.

4.8 Augmentation and Conservation of Fodder Resources

4.8.1 In addition to the production of grasses and legumes and tree fodder in wastelands, the production of fodder crops will be encouraged in cultivated areas. This will require incentives on seeds and demonstrations on fodder production. Fodder resources will be improved with efficient use of maize and sorghum biomass. Presently these are fed to the animals as whole plants. The wastage is more than 50%. It is proposed to supply chaff cutters to some people initially as demonstration. At least one chaff cutting machine (costing about Rs. 2,000) should be supplied in each village. Thus in all 161 chaff cutters (Ratlam 46, Dhar 43 and Jhabua 72) may be supplied during this project period. This will cost about Rs. 32,000.

4.8.2 Efforts will also be made to introduce and promote the technology of silage making so that surplus green fodder could be kept longer and made more nutritious. At the same time the use of soyabean biomass, which generally goes waste, will be promoted as dry fodder just as in the case of wheat '*bhusa*'.

4.9 Dairy Development

4.9.1 Improvement of local cows will be a priority component. In addition to improvement of breed, cross bred cows of improved breeds will be supplied to target groups on 50% subsidy and 50% credit basis. It is estimated that the cost is recovered in one year provided milk marketing arrangements are made fool-proof. This should preferably be done on cooperative, basis if possible. A real and efficient cooperative movement will be required to be promoted.

4.9.2 The supply of milch animals is one of the best ways of instant employment and income. This will also prevent migration. Subject to availability of fodder and health support, dairy development should be promoted. A good cow will provide an income of about Rs. 500 net per month on an average. If the gross income is taken into consideration it may be equivalent of 2 man-days per animal. An efficient dairy keeper earns more than this.

4.9.3 The ongoing dairy programme will be continued as such but will get strong support in fodder production, hygiene and health care. The project efforts and funds will be additional to ongoing programme.

4.9.4 Large scale castration of the existing poor breed bulls will be undertaken as a pre-condition. The young unemployed persons be trained in castration and motivated by payment of some incentive, say Rs. 5 per animal.

4.9.5 Artificial insemination with semen of pedigree bulls will be another pre-condition for departmental activity. Local youngmen should be trained and motivated to take up this service. Of course, the semen in nitrogen containers will be stocked by the State Government as its normal activity. The project can help in procurement of equipment and training, if needed.

4.10 Poultry Development

4.10.1 A local breed known as Kadaknath is very popular and its eggs and birds sell at a premium. Tribals are fond of poultry. The present scheme of supply of 25 birds per family should be continued with State funds. The project funds will initiate similar activity for wider coverage. This will be supported by health and hygiene coverage (a pre-condition).

4.11 Role and Involvement of Women

4.11.1 The mission recognises the productivity status and potential contribution of women in the successful implementation of the project as a whole. They contribute about 60% to farm operations. In addition, the collection of fuelwood, fodder, household work and rearing of children are solely their responsibility. Unfortunately, the status of women in the society and decision making is almost negligible not withstanding their commitment, dedication and contribution to the family and the society. The first priority of a woman member (even earning) is to feed her family and then part-take herself whatever is left even if she has to remain hungry or half-fed. On the other hand, man's first priority is himself - may be a drink, food or clothes.

4.11.2 The project will initiate step for the improvement of economic and social status of women in every possible way. These may include;

- Allotment of pattas (right of ownership) of land to women for horticulture, agriculture and other purposes.
- Provision of improved chulas, biogas plants and other such facilities for improving the environment and reducing the work load of women.
- Special training in agriculture, horticulture, environmental works, dairy and poultry farming, para vets and dais etc.
- Implementation of beneficiary oriented schemes like supply of poultry bird, dairy animals for women (atleast preference).

4.11.3 Women will also be encouraged for employment as coordinators for motivating people in general and women in particular for actively participating in the project activities. The project will also aim at removing the gender bias and give special consideration to women.

4.11.4 Special thrift schemes, where group dynamics are strong to overcome the present day problems will be encouraged so that the hold and bondage of the highly exploitative money lenders are totally eliminated (alongwith other credit schemes) or atleast substantially reduced.

4.11.5 The report submitted by Ms. Parbeen singh is enclosed in original.

4.12 Forestry Development

4.12.1 In the context of increasing forest productivity from these watersheds to meet the demands of local population for fuel, fodder and timber (there is acute shortage of these resources); safeguarding and conserving soil and water resources; environmental security and income generation and employment potential of forest plantations, a major afforestation effort (including pasture development) with the right species is a key component of a strategy for the development of these watersheds and to preserve and increase their forest resources. This would include:

a) Plantations in Government forests including rehabilitation of degraded forests.

b) Development of wastelands through silvi-pasture plantations.

c) Plantations on private/community lands including farm forestry, agroforestry and bund plantations.

d) Decentralised (Kissan) Nurseries.

4.12.2 The actual forest area in the three watersheds as obtained from the records of the Forest Department is of the order of 5,400 ha of which 658 ha are Reserve Forest and the balance of 4,743 ha as Protected Forest (Annexure V). This entire forest area is practically confined to Undwa Khal Watershed (Ratlam) with 124 ha of Reserved Forest in Sarangi Watershed (Jhabua). There is no forest area in Badnawar (Dhar) watershed.

4.12.3 Over 90% of the forest area is highly degraded and continues to be under heavy pressure of grazing causing accelerated runoff and soil loss with attendant consequences. These unproductive degraded forests serve as mere exercise grounds for cattle, sheep and goats who graze in these areas and have been invaded at a number of places by Lantana which forms a thick mat over the area. There is thus an urgent need to afforest and rehabilitate these areas through protection, regular and enrichment planting of the right species and treatment of existing root-stock using appropriate technologies. The primary aim of such an afforestation and rehabilitation effort being to meet the fuel, fodder and timber requirements of the local population besides environmental security.

4.12.4 The treatment and afforestation of forest areas within these watersheds will be the responsibility of the GOMP and DANIDA will not provide any funds for the same. However, the entire treatment planning and implementation will be an integral part of the project. In fact, the Forest Department, GOMP, is already trying to rehabilitate these areas and some of the areas have recouped very well under effective protection from biotic influences. Regeneration of degraded forests is also being done through schemes on Tree Cooperatives, Village Forest Protection Committees and Eco-Restoration and Afforestation in Wastelands, with the active involvement of the local communities. These schemes need to be extended to forest areas within the watersheds for their restoration. Such schemes also primarily benefit the poorer sections of the society, landless, and marginal and small farmers.

4.12.5 Of the total treatable area of 60,840 ha in the three watersheds, arable land accounts for 46,019 ha while 14,821 ha are non-arable wasteland. If the condition of forest areas is bad, that of these wastelands is worst.

4.12.6 Nearly 6,000 ha of wasteland are proposed to be brought under horticultural plantation and the balance of 8,821 ha need to be developed as fuel, fodder and timber reserves through silvi-pasture plantations using appropriate technologies. Such plantations of suitable trees and shrubs need to be widely spaced (6m x 4m) with grass and legume mixtures in the intervening spaces for pasture development.

4.12.7 Apart from raising of fuel, fodder and timber plantations on public lands (Government forests and wastelands) and providing alternative sources of energy to the local population, these resources need to be augmented by raising of such plantation on private/community lands to the release pressure on Government lands specially the forests. These plantations could be raised under the New Social Forestry Plan of the GOMP wherein subsidy is provided to small, marginal and other farmers who undertake plantations under various schemes of farm forestry, agroforestry and bund plantations.

4.12.8 The scheme on Decentralised (Kissan) Nurseries is already in operation in the State (Forest Department) and has proved very successful, in that even landless people have become beneficiaries of the scheme. This scheme needs to be extended to the project area with 100% buy-back arrangements.

4.12.9 It must, however, be emphasised that the success of any afforestation or forestry development programme (including pasture development) would depend on effective protection of such areas (which is a must) from adverse biotic influences. The regenerative capacity of these watersheds is very good and examples can be multiplied both inside and outside the watersheds, where effective protection has resulted in regeneration of areas in a very short time.

4.12.10 The greening of watersheds can only be achieved with active involvement of local communities (including women), their participation and support that ensures protection of forests through social fencing and application of sound ecological principles for the sustainable management of these watersheds. It is now widely recognised that the effective involvement of local communities in the management and sustainable development of forest resources is the only alternative to problems of deforestation and land degradation in India. Therefore, consistent with the National Forest Policy of 1988, GOI, issued policy guidelines to all state governments on June 1, 1990, supporting greater participation of village communities and NGOs in the regeneration, management and protection of degraded forests. In pursuance of these instructions GOMP has also issued an enabling order (Order No. 16/4/10/2/91 dated 10.02.91) in this regard.

4.12.11 There is need to change the strategy for afforestation. In view of the highly degraded condition of the watersheds coupled with poor and erratic rainfall and lack of moisture, in situ soil and moisture conservation practices should form an integral part of the planting programme with emphasis on planting of drought-hardy shrub and tree species along with suitable grass and legume mixtures. The areas should be strictly protected from grazing and people may be allowed to cut and carry grass. The strategy should aim at producing more fuelwood and fodder. Further, in order to release pressure on forests for meeting fuelwood requirements, emphasis be laid on fuel saving devices like improved Chulas as well as alternate sources of energy like biogas and solar cookers in selected parts of these watersheds. It is estimated that this would cause nearly 50% reduction in the consumption of fuelwood.

4.13 Establishment of Nutrition Gardens

4.13.1 The deserving target group households will be supplied with about 10 quick growing horticultural plants like custard- apple, pomegranate, amla, mango, papaya (etc) for raising near households or in the land holdings for internal consumption and sale of surplus produce. Similarly, seasonal vegetable seeds and seedlings suitable for local condition will be supplied. This will provide much needed nutrition, some additional income and part employment.

4.14 Household Production and Nutrition System

4.14.1 Small units of poultry, goat, fish seeds, sericulture, bee- keeping, rope, basket and broom making, workable sets of machines, tools and equipment for black-smithy and carpentry and allied rural worker employment units will be supplied to target groups alongwith appropriate training for self employment. At least one set of units will be supplied in each village which may employ 2-3 persons in each village. The project should specially aim at grassroot capitalisation with optimum utilization of skills which many people have (or can learn quickly) but cannot take advantage because of lack of funds (capital) and disposal at reasonable prices.

4.15 Agriculture Extension and Training

4.15.1 In a project of the type contemplated, extension will play a significant role in making implementation a success. The project team will need dedicated personnel who will have to go to the villages and persuade them to adopt newer technologies for dryland farming. The ongoing extension system (T & V pattern) will be improved, modified and strengthened. The number of grassroot level extension workers should be doubled so that their area of operation and coverage of families is reduced by 50%. The extension staff will take up some additional responsibilities of (i) special concentration on target groups,(ii) coverage of welfare schemes and motivation of the people as well as the implementation of the programme for landless families. In short they will be grassroot level technology conveyers and motivators for the entire population in general and target groups in particular. They will be guided by the SMS in important activities, both for training and field level application of technologies. The SMS will be responsible for atleast 10% direct contact with the families in their jurisdiction, if not more. Additionally each SMS will adopt a village to develop it into a model in five years or so. Similarly, each senior functionary will adopt a village for all-round development.

4.15.2 A demonstrative effect will need to be created. For that, it may be necessary to devise a system of regular study visits for the farmers - both men and women. Selected farmers in groups of 15-20 could be shown fields where successful farming has been done, new technology has been adopted , new cropping patterns have been worked out, and useful implementation is under operation, and to the watershed works of Agriculture University, Indore besides the inspiring work done by Kasturba Gram Krishi Kshetra, Indore.

4.15.3 Similarly, project personnel will need a regular system of training and orientation. For that purpose the existing training infrastructure at the KVK, Jhabua and College of Agriculture, Ujjain, could be utilized. In addition, training/orientation at College of Agriculture, Jawaharlal Nehru Krishi Vishv VIdyalaya (Agriculture University), Indore and Kasturba Gram Krishi Kshetra, Indore, will also be useful.

4.15.4 The basic training in watershed development technology will be provided by the State Agriculture University, (SAU). This will be supported through line departments wherever necessary; particularly, where the relevant discipline is weak in the SAU. The scientists will also pay field visits for assessing and evaluating problems at regular intervals.

4.15.5 Atleast one reorientation course will be organized once in a year where latest developments in watershed development will be brought to the notice of all extension workers.

4.15.6 Some well known NGOs like Kasturba Gandhi Gram Kshetra, Indore, will be involved in practical training of important disciplines like rainfed agriculture, horticulture, dairying, biogas plant, improved chulahs, compost making and allied aspect for men and women of the area. The experts of such NGOs should also be associated for imparting short duration training, especially to women, in the project area.

4.15.7 Finally the extension system will keep in view the non-cropped period and engage the workers suitably in other activities.

4.15.8 The tours and field visits of extension workers, farmers (including women) and other workers engaged in activities other than farming will be arranged to places of excellence in this respect within India and abroad if the situation so warrants.

4.16 Inputs

4.16.1 Broadly, the following inputs into the project are called for:

- Extension.
- Training/demonstration.
- Village based training workshops.
- Peoples' participation.
- Public policy support by Government.
- Appropriate inputs - seeds, fertilizers etc.
- Appropriate tools/implements.
- Credit.

- Full complement of staff exclusively for project work.
- Evaluation system for rewards.

4.17 Assumptions

4.17.1 Following assumptions have been made in working out the proposed project.

- That the GOI and GOMP will continue to accord high priority to development based on watershed basis.
- That the farmers in the project area, more particularly the targeted groups such as small and marginal farmers, landless labourers, people below the poverty line, women and other beneficiary groups will be highly motivated and will take an enthusiastic part in project activities.
- With increased horticultural produce, it will be possible for the farmers to market the same in surrounding markets specially in Ratlam and Indore.
- That the GOMP as a matter of public policy, will introduce measures to rationalize exploitation of ground water resources by tube-wells.
- Transfer of funds to the project will be smooth.

4.18 Risks

4.18.1 In devising the present project proposal, an integrated approach has been followed for efficient and quick achievement of objectives. However, experience has shown that during the process of implementation several hurdles, constraints and pitfalls are met. While all such problems cannot be foreseen, care has to be taken of some of the risks. These may be:

- The treatment of land in patches should be avoided. The strategy to be followed should be area based integrated approach.
- Inadequate local planning may result in either poor results or imbalanced growth. Planning should, therefore, be thorough and location specific.
- Lack of enthusiasm and positive response from the people could endanger the project. There may be many contributing factors - one of them being selection of wrong beneficiaries or application of facilities (incentives) without looking into the requirements of the people particularly, poorer sections.
- Inadequate orientation and lack of commitment on the part of the implementing staff and committee members in the philosophy, objectives and technology of the project may also endanger the project. These have to be ensured.
- Imbalance between the requirements and actual supplies of inputs both in respect of quantities and time.
- Lack of flow of funds to the project could choke the project to death. It should be ensured that none of the project activity is delayed for want of funds.
- The interdepartmental rivalry or ego should be taken care of so that it does not hinder implementation.
- Caste differences may make cooperation among different communities difficult. Project management should handle such situations with care.

V ORGANISATION AND ADMINISTRATION

5.1 Project Management

5.1.1 Appropriate organisational structure holds the key to successful planning and implementation of the project. Project area falls under the jurisdiction of three District Collectors (Ratlam, Jhabua and Dhar), two Commissioners (Ujjain and Indore), two Joint Directors of Agriculture, and three Deputy Directors of Agriculture. For effective coordination of work in the project area some special organisational structure will need to be developed which will take care of the practical and production oriented nature of the project.

5.1.2 Each of the sub-watersheds in the three districts i.e. Undwakhal watershed in Ratlam District, Sarangi Watershed in Jhabua District, and Badnawar in Dhar District is proposed to be placed under a project team headed by an officer of the Agricultural Department to be called the Project Manager. He will be an officer of the level of Deputy Director of Agriculture in the district. He will be assisted by a team of SMS from the concerned line Departments of Agriculture, Horticulture, Animal husbandry, Forestry, etc. and grassroot level workers. The strength of the project team may be fixed in such a way that the number of families each official has to look after will be half the number of normal families under T & V system. This will add strength to the project team to deal with landless families and other non-agricultural activities also.

5.2 Project Level Implementation and Advisory Committee

5.2.1 A Project Level Implementation and Advisory Committee (PIAC) will be constituted with the Project Manager as its Chairman. All the heads of line Departments in the watershed area, a representative of the NGOs, and two representatives of the people, (atleast one of whom should be a woman) will be its members. By and large these will be sort of motivators and vital link between the project management and the population (mostly beneficiaries) of the project area. The PIAC will meet atleast once a month and minutes of its meetings will be sent to the District Collector and the Project Director.

5.3 District Level Project Coordination Committee :

5.3.1 At present the coordination of line departments in the district is being done at Collector's level. Since the watershed development areas are parts (though minor) of the district, the involvement of the collector, who is head of the district and enjoys a good deal of power at district level, would be necessary with the project. A coordination committee of all the district level officers, to be called District Level Project Coordination Committee (DPCC), of the line departments and the Project Manager will be constituted. Atleast three non-official members of the PIAC will be members of this Committee and the

Project Manager will be the Member-Secretary. Besides coordination, and review of the project activities, the Committee (or the Collector) will ensure that the district heads of the line departments are providing full assistance and cooperation to the project authorities.

5.3.2 The DPCC will have meetings atleast once in two months preferably in the project area itself. Project Director will also attend these meetings.

5.4 Inter-district Coordination of Project Activities :

5.4.1 The present set up of two Commissioners, three Collectors and two Joint Directors of Agriculture for three project areas is not conducive to proper inter-project coordination and implementation. As such it is proposed that a separate project implementation and cooperation cell will be created. This will be a small cell under the charge of a senior officer of Agriculture Department of the rank of Joint Director of Agriculture with some skeleton staff. He can be assisted by a Technical officer of the Deputy Director level. This cell will be responsible for inter-district coordination. The head of the cell may be designated as Project Director so that there is attraction for senior Joint Directors to be posted there. Project Director will be the technical head of the project and its chief executive. As far as possible the headquarter of the cell should be in the project area.

5.5 State Level Project Steering Committee (SPSC) :

5.5.1 This committee will be headed by the APC with Secretary (Agriculture) as Vice-Chairperson. Secretary (Forest), Director of Agriculture, Director of Horticulture, Director of Animal husbandry, Principal Chief Conservator of Forests, (PCCF), Warden of Fisheries and all heads of the concerned line departments including Rural Development, Social Welfare, Women Welfare, Tribal Development etc. will be its members. A representative of the GOI, Ministry of Agriculture (Watershed Development Cell), SAU, and DANIDA will also be its members. The two Divisional Commissioners and the Collectors of the three concerned districts will also be represented. The Committee can coopt any other member/members and will meet atleast three times in a year to review the progress and to look into the problems and constraints affecting project implementation.

5.5.2 The first evaluation will start after the completion of one year of the project and will thereafter be an annual affair.

5.5.3 The Project Director will be the Member-Secretary of the SPSC.

5.5.4 In addition to the arrangements mentioned above, it would be necessary to ensure that experienced, competent and committed personnel are not only attracted but also like to stay with the project for showing results. Some of the steps that may help in this direction are :

- Project personnel should not be subject to transfers save in exceptional circumstances.
- The whole complement of the proposed staff drawn from various Departments of Agriculture, Forestry, Soil Conservation, Horticulture, Veterinary, Dairy, Extension etc. should always be present - There should be no vacant posts.
- To attract suitable officials to the project, State Government may consider granting of Project Allowance to them.
- Project personnel with outstanding performance should be rewarded.
- The size of the project team may be determined by the State Government on the basis of norms adopted in the World Bank assisted Parua Nala project.
- Active involvement of some of the NGOs like Kasturba Gandhi Gram Kshetra be ensured right from the beginning even if such organisations have to be provided incentives for participation in the programme.

5.5.5 An organogram indicating the coordination of the project at various levels and its implementation is given at Annexures X and XI.

5.6 Organisational and Financial Sustainability

5.6.1 The project as conceived by the State Government is organisationally well-founded. The various technologies recommended and the inputs suggested are all based on experience. GOMP has gained experience in implementing various watershed projects under the NWDPRA as well as on World Bank assisted Parua Nala Project. The State Government has technical staff well-versed in watershed technology.

5.6.2 The project as conceived is sustainable financially also. The various inputs suggested and costing done is justified and is by and large within the national approach in NWDPRA.

5.7 Budget and Financing

5.7.1 GOMP has proposed an out-lay of Rs. 212 million on the three sub-watersheds as below :-

Undwa Khal	Rs. 85 million
Badnawar	Rs. 65 million
Sarangi	Rs. 62 million

5.7.2 The State Government has worked out costs on the basis of group of activities such as establishment costs; conservation measures; crops; training; research support; nurseries; cottage industries; etc. The average cost per ha that has been worked out is Rs. 3,458.

5.7.3 DANIDA who has agreed to fund this project has not placed any limitation on the extent of funds required. Their only requirement, as explained to the mission during the briefing at New Delhi, is that the project should be technically sound and financially viable.

5.7.4 At this stage, it is not possible for the mission to work out the exact costs involved in the execution of the project. This can be done only after the State Government has surveyed the whole area and drawn up an Action Plan based upon location specific activities to be undertaken. What can be stated at this stage is that the activities to be undertaken which have been listed by the GOMP are adequate; although some amplifications and additional activities would be necessary to be undertaken in the proposed terrain. What can be further stated is that the rates per unit at which costs have been worked out are by and large sound. In fact, these estimates are within the costs per ha as recommended in the NWDPRA, i.e. Rs. 3,500.

5.7.5 However, it may be pointed out that the proposed project area is one of the most difficult areas to be treated with watershed technology. There are no soft options in this project; the entire land is rocky and degraded. The mission, therefore, believes that treatment costs per ha in the proposed project area would be higher. Moreover, horticulture is to receive special attention. About 10% of the treatable area in the project i.e. about 6,000 ha will be devoted to development of horticulture. This is bound to push up costs. Further, in the project a number of activities have been proposed which go beyond the NWDPRA approach such as dairy development, development of nutrition gardens, demonstration on silage, seed money for women welfare activities, development of cottage industries and other income generating activities, provision of improved chulahs, provision of biogas plants, and promotion of herbal medicines. These activities are new but have been recommended because they would ensure success of the overall project.

5.7.6 The net effect of these activities would be that cost per ha will increase from Rs. 3,458 to about Rs. 6,000 and the total fund requirements may be to the extent of about Rs. 380 millions.

VI ISSUES

6.1 Treatment of Forest Areas

6.1.1 The treatment and afforestation of forest areas within the watersheds will be the responsibility of the GOMP and DANIDA will not provide funds for the same. However, the entire treatment planning and implementation will be an integral part of the project.

6.2 Ongoing Schemes

6.2.1 The ongoing schemes like dairy development, poultry bird supplies, energy saving devices etc. will continue to be operated. However, their planning and implementation will be integrated with the DANIDA supported watershed development programme.

6.3 Staff

6.3.1 The existing staff of the Agriculture and other departments concerned with the programme will continue with suitable reorganisation and adjustment. DANIDA will only fund additional staff. The entire staff will continue to function even after the closure of DANIDA support as the program will continue till its saturation level. GOMP will ensure that, save in exceptional circumstances, the staff will not be transferred.

6.3.2 GOMP will ensure proper coordination, monitoring and supervision at the project, district and state levels.

6.3.3 The State Government will also ensure the association and active support of the State Agriculture University regarding provision of technology, training and full R&D back-up.

6.3.4 The State Government will actively promote and facilitate peoples' participation in project programmes.

6.3.5 Arrangement for credit for the supply of seeds and other inputs will be made so as to meet the full requirements of atleast the target groups. Cooperative and such groups or organisations for these and other such purposes will be encouraged.

6.3.6 The scrub bulls in the area where dairy development is taken up will be castrated through an incentive oriented scheme.

6.3.7 Posting of full complement of staff and their mobility in accordance with project requirements will be a pre-condition for the start up activity and funding.

6.3.8 Government will allow enough flexibility to the local staff (management) for adjusting their programmes in accordance with location specific requirements. The project level staff will be competent to make adjustments upto 15% of the budget and district level coordination committee upto 30%, provided the programme is within the broad outlines and philosophy of the project.

VII FURTHER STUDIES

7.1 The data base is weak; information on various important aspects is not available. This makes planning difficult and faulty. The mission therefore, recommends the following studies:

7.2 A detailed survey of the existing status of land and its mapping be carried out (as far as possible). Many patches of land which are wastelands and unfit for cultivation are still being cultivated. Similarly many areas which have no trees or even grass are shown as forests. The actual situation prevailing in the area should, therefore, be clear before the implementation starts.

7.3 While surveying the area under fruit trees, their number may also be enumerated so that follow up action could be taken.

7.4 Several farmers including the tribals have done very well in agriculture, horticulture, dairy and even in cottage industry. Such success stories should be recorded with investments, productivity and economic results. These will be good examples for others to follow and will also be good places for field days in the beginning.

7.5 Sample survey of underemployment and unemployment in farm sector be carried out. The extent and pattern of migration should also be determined. Important reasons for migration and steps that will prevent or reduce migration (according to migrants own perception) be identified.

7.6 A survey for determining the economic and social status of the various groups be carried out on selective basis.

7.7 A comparative study of the World Bank assisted Parua Nala Watershed Project be carried out.

VIII EMPLOYMENT POTENTIAL

8.1 Major contribution towards employment generation and reduction in migration will be made by land based activities in general and agriculture, horticulture and forestry sectors in particular. Dairy and other sectors will be important for individuals and their families (self-employment) but their contribution in the overall employment will be limited.

8.2 Under the present mono-cropping system, requirements of manpower ranges from 15 man-days per ha (gram) to 98 man-days (cotton). Average of different crops is 30 man-days per ha. The improvement of production system with latest package of technology will require about 60 man-days per ha (almost double). Thus an area of 41,500 ha under crop husbandry with 115% crop intensity will employ about 2.88 million man-days in the fifth year as against 1.44 million at the present level of production.

8.3 Another significant contribution will be with the increase of cropping intensity. It is proposed that the present intensity of about 115% be increased to 130% in five years and 160% in 10 years. This will generate about 3.237 million man-days annually in five years and 3.994 million man-days in 10 years.

8.4 An area of 6,000 ha is proposed to be brought under tree crops. Employment potential ranges between 250-400 man-days per ha upto the fourth year. It may then be 400 man-days per year including watch and ward and harvesting from the fifth year onwards and about 850 man-days annually when fully grown. Six thousand ha will, therefore, create a potential of 2.1 million man-days in the fifth year and 5.1 million man-days form 8-10 year onwards.

8.5 Dairy sector's employment potential will depend upon the number of cows supplied. Two pairs of cows may need about 1/2 man-day daily or about 90 man-days per cow annually. Accordingly, 500 cows may generate employment of 45,000 man-days.

8.6 The employment in these three sectors alone will be to the extent of about 5.382 million man-days annually in five years and 9.139 million man-days in 10 years. Employment of about 9.139 million man-days means 25,038 men or women employed all the year around. Thus 25,000 families with a population of 125,000 people will be (theoretically) benefited as against the present population of 118,156. This is the minimum figure as the employment in irrigated areas which is 2-3 times more has not been taken into consideration. This and other employment component, will take care of any shortfall due to adverse circumstances in the agriculture sector.

8.7 The employment potential generated as a result of afforestation activities will be of the order of 4.2 million man-days over a period of three years assuming an average of 300 man-days per ha.

ANNEXURE I

ITINERARY OF THE MISSION

Date		Particulars		
21.10.92	F.N.	Departure New Delhi Arrival Bhopal	06.15 14.00	By Train hrs
21.10.92	A.N.	Discussion with APC, Secretary (Agriculture), Director of Agriculture and other officials of State Government on priorities, and policies of the State Government.		
22.10.92	F.N.	Departure Bhopal Arrival Indore	09.00 13.00	hrs hrs
	A.N.	Visit Kasturba Gram krishi Kshetra, Indore.		
23.10.92	F.N.	Departure Indore Arrival Ratlam	08.00 11.00	hrs hrs
		Visit project villages		
	A.N.	Visit project villages, discussions with villagers, discussions with State Government officials	21.00	hrs
		Night halt at Ratlam.		
24.10.92		Visit project villages , discussions with beneficiaries, meeting with Collector,Ratlam, Mr. Vinod Samwal.		
		Departure Ratlam Arrival Indore	19.00 22.00	hrs hrs
25.10.92		DIWALI		
26.10.92		Discussions with Mission leader on project strategy		

Date		Particulars	
27.10.92		Visit College of Agriculture, Jawaharlal Nehru Krishi Vishw vidyalaya (Agricultural University,Indore. Discussions with Dr. Gupta, Chief Scientist, College ofAgriculture, Indore.	
		Visit to university farms.	
		Visit to Hingonia Watershed developed by the Agricultural Univesity.	
		Return to Indore.	19.00 hrs
28.10.92	F.N.	Departure Indore	07.00 hrs
		Arrival Jhabua	11.00 hrs
		Visit Government Poultry Farm, Jhabua.	
		Meeting with Collector, Jhabua, Mr. R.S. Julaniya.	
	A.N.	Visit project villages, discussions with villagers.	
		Discussions with Collector, Jhabua, over dinner.	23.00 hrs
		Night halt at Jhabua.	
29.10.92		Mission was divided into three groups.	
		Visit to project villages from 07.00 hrs	
		Depature Petlawad	17.00 hrs
		Arrival Indore	22.00 hrs
30.10.92		Report writing at Indore	
31.10.92		Report writing at Indore	

Date	Particulars	
01.11.92	Departure for District Dhar	07.30 hrs
	Visit to project villages- Discussions with district officials	
	Return to Sardarpur Night halt at Sardarpur	22.00 hrs
02.11.92	Mission was joined by Mr. Jens Rasmussen of DANIDA and Mr. Saxena of Ministry of Agriculture, New Delhi.	08.00 hrs
	Visit project villages , discussions with project beneficiaries.	
	Return to Indore	19.00 hrs
03.11.92	Discussions with Mr. Rasmussen (08.00 to 10.00 hrs)	
	Departure for Ujjain Arrival Ujjain	10.00 hrs 12.00 hrs
	Discussions with State Government officials	
	Discussions with Mr. Rasmussen (15.00 to 18.00 hrs)	
	Night halt at Ujjain	
04.11.92	Departure for Bhopal Arrival Bhopal	08.00 hrs 12.00 hrs
	Discussions with Mr. Rasmussen	14.30 hrs
	Discussions with Secretary (Agriculture),Ms. Alka Sirohi	20.00 hrs
05.11.92	Mission members called on the Chief Minister,Madhya Pradesh	08.30 hrs
	Discussions with Mr. Rasmussen on logical framework	10.30 hrs to 19.00 hrs
06.11.92	Departure Bhopal Arrival New Delhi	14.00 hrs 22.30 hrs

GIST OF DISCUSSIONS HELD WITH THE AGRICULTURAL PRODUCTION COMMISSIONER, GOVERNMENT OF MADHYA PRADESH AND OTHER STATE OFFICIALS AT BHOPAL ON 21.10.92

Briefing meeting with Mr. S. Satyam, APC was attended by the Secretary (Agriculture), GOMP, Director of Agriculture, and other state officials. Representatives of the GOI, Ministry of Agriculture, were also present. Explaining the priorities and policies of the State Government, the APC made the following points:

- The State Government is now laying considerable stress on proper land use policies. The Chief Minister holds the view that land should not be over-exploited and that we should leave the land in a better shape for posterity. State Government has already set up a State Land Use Board for evolving and pursuing policies in this regard. GOMP has also drawn up a 20-Year perspective plan for land use.
- In the original proposal, the State Government had proposed to cover four districts including Mandsaur. However, at some stage, Mandasaur was left out of consideration. APC observed that the soil conditions and other sociological factors prevalent in the area are common. The major threat to the area is of the marching desert from Rajasthan . In view of the commonality of problems in the watershed areas chosen for DANIDA assistance, the APC made a strong case

for reinstating Mandsaur District for DANIDA assistance. He explained that geographically Mandsaur has a common border with Ratlam District which is being covered by DANIDA assistance. Taken together Dhar, Jhabua, Ratlam and Mandsaur form a contiguous geographical block having common problems. Hence, the APC urged the DANIDA Mission to reconsider the matter and include Mandsaur watershed also in the areas to be covered by DANIDA assistance. To make a large and visible impact of DANIDA assistance, APC suggested that area to be covered may be increased to 120,000 ha. Additional area is available in the proposed watersheds and the State Government is equipped to treat this additional area.

State Government would like maximum introduction of horticulture crops. The project area is particularly suitable for horticultural crops and, therefore, the team was advised to pay attention to this aspect.

State Government would favour construction of check-dams wherever considered absolutely necessary.

GIST OF DISCUSSIONS HELD WITH THE CHIEF MINISTER, ON NOVEMBER 5, 1992.

The DANIDA Mission called on the Chief Minister, Mr. Sunderlal Patwa on November 5, 1992. Secretary (Agriculture) Ms. Alka Sirohi and other state officials were present. DANIDA was represented by Mr. Rasmussen.

The Mission leader informed the CM that the area chosen by the State Government for DANIDA project is the most appropriate area for developmental work. Project area suffers from land degradation and there is chronic shortage of water. Crop productivity is low, and employment opportunities almost non-existent, forcing landless/marginal farmers to migrate in search of employment.

The CM was also informed about the project strategy. An effort will be made in the project to undertake activities for conservation of soil moisture, prevention of land degradation, a new system of crop rotation with emphasis on horticultural crops etc. An integrated approach will be followed so that target beneficiaries draw the maximum benefit.

The CM appreciated the project strategy and stated that there are common goals to be achieved. He made a forceful plea for inclusion of Mandsaur District to be included for DANIDA assistance as also the provision of check-dams for stroage of water for irrigation. Mr. Rasmussen informed him that Mandsaur could be considered in the next phase of the project.

ANNEXURE IV

AID MEMOIR

BROAD OUTLINES OF THE PRELIMINARY FINDINGS OF DANIDA MISSION FOR PRE-APPRAISAL OF THE WATERSHED DEVELOPMENT PROJECT IN WESTERN MADHYA PRADESH

(SUBMITTED ON NOVEMBER 4, 1992)

Background

1. A DANIDA mission comprising of Messers Harbans Singh, Agronomist (Team leader), O.N. Kaul (Forestry Expert), S.S. Ahluwalia (Institutional Expert), Ms. Parbeen Singh (Socio-economist) visited the proposed project areas from October 22 to November 2. Dr. S.L. Seth, Additional Commissioner and Mr. S.B. Saxena of the Ministry of Agriculture also accompanied the mission for some of the days. Mr. Jen Rasmussen of Royal Danish Embassy also joined the mission on November 1, 1992.

2. The mission had extensive tour of the proposed project areas in the districts of Ratlam, Jhabua and Dhar. The proposals, submitted by the GOMP were examined in detail. During field visits the mission studied in detail the existing status of the natural resources and the population of the area as well as the problems and constraints. The mission met a large number of men and women of different groups of population, extension workers, officers, NGOs and social workers. After in-depth analysis of the problems and constraints and causes of the existing situation, the mission deliberated on the

remedial and corrective measures required to be taken under different sets of conditions. The observations and the broad recommendations of the mission are set out below :

Present Situation

3. The population of the area particularly the weaker sections are suffering from extreme poverty and malnutrition. Women are the worst affected. For the major part of the year, they are umemployed and forced to migrate. Generally the migration is co-terminus with the end of crop season. There is chronic shortage of fuel and fodder resources. In most of the area there is serious problem of water. The sub-soil water is at its optimum level at the end of monsoon and starts going down from November onward. There is even shortage of drinking water from February-March onwards.

4. The income from natural resources is decreasing. Soil erosion is increasing and adding to the wastelands. In short this is the result of the unsustainable use of the natural resources. This has caused environmental and ecological problems. The existing land resources cannot sustain any longer the human and cattle population. The situation is at such a stage that unless remedial and corrective measures are taken immediately, it may be too late to reverse the process of degradation.

5. The mission has concluded that the proposals submitted by GOMP for the improvement in project area are feasible. The technology strategy and important (main) components are briefly mentioned. These may be considered as only outlines as details are yet to be worked out.

6. All categories of lands (cultivated, forest, wastelands etc.) will be treated with the application of easy to understand cheap, replicable, sustainable and dynamic technology of moisture and soil conservation *in situ*. Effort, will be made to conserve soil and moisture for better productivity. This will mainly comprise of vegetative hedges in contour, contour cultivation and plantings, providing conditions for optimum water infiltration in the soil, reduction of the water runoff (consequent floods with soil erosion). Besides improved production, it will improve the ground water situation, fuel and fodder production and increased employment.

Crop Husbandry

7. Improved agricultural production will be one of the most important activity. Increased production and intensity of cropping will increase income and crop season providing more employment opportunities. It is roughly estimated that employment in agriculture will increase by 50% if not more. The area will be saturated with the latest technology package within five years.

Rainfed Horticulture Technology

8. Rainfed horticulture will receive special attention. This will be promoted both in cultivated areas and in the wastelands. This would be an incentive based component wherein the farmers and the proposed allottees of wasteland will get some renumeration for the proper maintenance of the trees. Only high quality plantating material will be

planted and technology for scientific management made available.

9. The improvement of existing orchard trees will be taken up to demonstrate the effectiveness of the technology.

10. There are large number of wild ber bushes in project areas. These are proposed to be converted into commercial cultivators through budding in situ.

11. The horticulutre plantation (existing and proposed) will provide substantial opportunities of employment more so in lean crop (agri) season. Infact, the project will be so designed as to provide employment opportunities when there is comparatively less or little work and other activities.

12. Propagation of horticulture, fuel, fodder and vegetative hedge material will be part of the project activities.

13. Vegetable cultivation under rainfed conditions will also be promoted.

Augmentation and Conservation of Fodder and Fuel Resources

14. Efforts will be made to meet the requirement of fuel and fodder in the villages in project area. For fodder production, wasteland will be used and legumes will be added to grass for improving nutrition and productivity. Similarly, fodder trees will be raised wherever suitable.

15. The fodder resources will be improved with the efficient use of the sorghum, maize and other crop biomass. Chaff cutters will be introduced; as at present the animals eat only 40-50% of the fodder. The soya bean biomass (bhusa) is not properly used at present. Its use will be promoted. Where ever feasible silage preparation and feeding will be introduced.

16. The ongoing dairy program of supply of hybrid better cows will be supported with the meeting of fodder requirements. Dairy development will be promoted.

Horti-pastoral System

17. Fodder will also be promoted in new horticulture plantations.

18. Plantation of fuel trees will be undertaken in cultivated areas and wastelands. Further more crops yielding fuel as a by-product like cotton and pigeonpea will be promoted to the extent possible.

Forest Plantations

19. In addition to fuel and fodder trees, the plantation of forest will be encouraged in the project area both in forest areas and wastelands. However, plantations of forests will be the obligation of the State Government. The forest areas within the project will be required to be treated.

Role and Involvement of Women

20. The mission recognizes the productivity status of women in the area as a whole. They contribute nearly 60% on farm operations. Besides, the collection of fuelwood, fodder and water is their sole responsibility. Household work is also attended by women. The status of women is required to be upgraded. The project will, therefore, undertake activities in this direction. These may include (a) dairy development (b) allotment of pattas for horticulture and other purposes in the name of women (c) provision of improved chulahs (also to save fuel) (d) biogas plants, etc. Women will be specially trained in these aspects as well as agriculture and

horticulture technologies. Participation of women in different project activities will be required.

Peoples' Participation

21. The project management will ensure that people of the project area in general and beneficiaries in particular actively participate in planning and implementation. NGOs may also be involved at different levels.

Organization and Management

22. An effective and efficient management is a necessary pre-requisite for the success of the project. The project management, by and large, will take care of all the project activities in an integrated manner. Additional staff required for the purpose will be created and posted. The continuity of the staff will be ensured save in exceptional circumstances. The organizational structure will provide for the close cooperation and active support of the district Collector and other departments. Posting of full contingent of staff would be a pre-requisite for starting the project.

Human Resource Development

23. Training will be provided for farmers and different level of officials. Orientation and training will be a continuous process.

ANNEXURE V

LAND USE STATISTICS IN THE PROJECT AREA

Name of the watershed	Total geographical area (ha)	Net cultivated area (ha)	Current fallow (ha)	Old fallow (ha)	Pasture beed (ha)	Total private land (ha)	Forest land (ha)	Reserve forest (ha)	Nistar/ pasture beed (ha)	Unculturable Wasteland (ha)	land put to non-agri use (ha)	Total Govt. land (ha)	Total treatable area (ha)	Total arable land (ha)	Total non-arable land (ha)	Approximate length of Drainage course (km)
Undwa Khal (Ratlam)	32494	16414	182	193	2073	18862	3458	4729	595	3287	1563	13632	26202	18862	7340	620
Badnawar (Dhar)	20569	13507	178	195	738	14618	1030	2256	1728	276	661	5951	17652	14618	3034	480
Sarangi (Jhabua)	19823	11613	301	264	361	12539	124	1195	1847	2476	1642	7284	16986	12539	4447	450
Total	72886	41534	661	652	3172	46019	4612	8180	4170	6039	3866	26867	60840	46019	14821	1550

Source: Comprehensive Watershed Development Project in Madhya Pradesh with DANIDA Assistance. Department of Agriculture, Madhya Pradesh, Bhopal.

Note : The actual figures of forest area in the three sub-watersheds as obtained by the Mission from the records of the Forest Department are as follows :

Name of the Watershed	Total Forest Area (ha)	Reserve Forest (ha)	Protected Forest (ha)
Undwa Khal (Ratlam)	5,276	534	4,743
Badnawar (Dhar)	-	-	-
Sarangi (Jhabua)	124	124	-
Total	5,400	658	4,743

ANNEXURE VI

LAND HOLDINGS IN THE PROPOSED PROJECT

Name of the watershed	Total No. of villages	Population	Total No. of farmers	Marginal	Small	Big	No. of total holdings	Total landless labourers
Undwa Khal (Ratlam)	46	34785	6813	2762	2396	1655	6813	1949
Badnawar (Dhar)	43	49726	8623	2745	1988	3890	8623	7247
Sarangi (Jhabua)	72	23645	2363	850	751	762	2363	4533
Total	161	108156	17799	6357	5135	6307	17799	13729

BREAK UP OF THE HOLDINGS

Name of the watershed	0 - 1 ha		1 - 2 ha		2 - 4 ha		more than 4 ha		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
Undwa Khal (Ratlam)	2096	2450	2762	3594	1300	2680	655	10138	6813	18862
Badnawar (Dhar)	2745	1287	1988	3482	1813	5040	2077	4808	8623	N.A
Sarangi (Jhabua)	850	NA	751	NA	560	NA	202	NA	2363	N.A

ANNEXURE VII

DATA ON POPULATION, FAMILY ETC. IN PROJECT AREA

Name of the watershed	No. of village	Population	Population below poverty line (%)	Scheduled Caste	Scheduled Tribes	Others	Landless labourers
Undwa Khal (Ratlam)	46	34785 18125(M) 16660(F)	53%	2110	2497	30178	1949
Badnawar (Dhar)	43	49726 26172(M) 23554(F)	70%	3169	12263	34267	7247
Sarangi (Jhabua)	72	23645 12039(M) 11606(F)	79%	1664	17608	4373	4533
Total	161	108156		6443	32368	68818	13729

ANNEXURE VIII

MAJOR KHARIF CROPS - PERCENTAGE AREA OF CULTIVATED CROPS IN PROJECT AREA

Name of Watershed	Paddy	Sorghum	Maize	Soyabean	Groundnut	Pulses	Cotton	Others
Undwa Khal (Ratlam)	-	3	11	16	2	3	37	28
Badnawar (Dhar)	-	-	14	44	-	9	17	16
Sarangi (Jhabua)	8	2	13	6	6	14.5	25	25.5

MAJOR RABI CROPS - PERCENTAGE AREA OF CULTIVATED CROPS IN PROJECT AREA

Name of Watershed	Gram	Wheat	Pulses	Mustard	Others
Undwa Khal (Ratlam)	17	66	4	1	12
Badnawar (Dhar)	15	70	9	-	6
Sarangi (Jhabua)	31	49	1	-	19

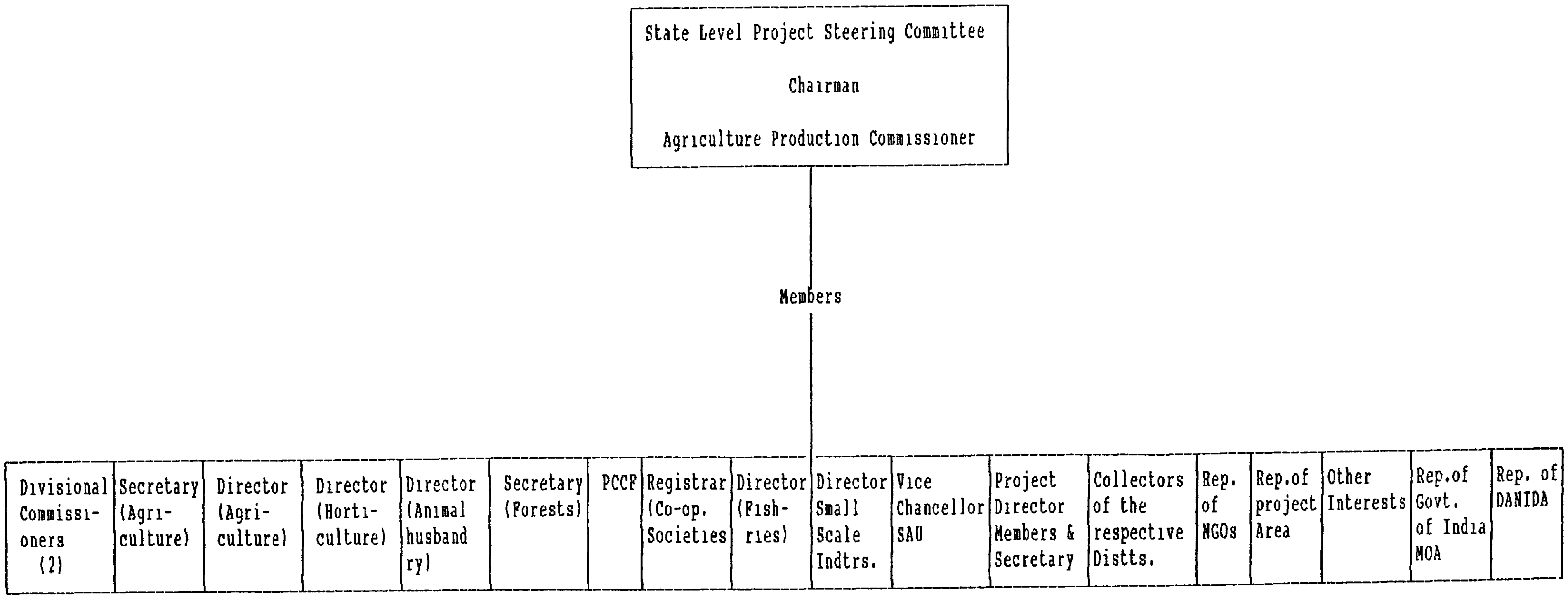
ANNEXURE IX

DATA ON RAINFALL IN THE PROJECT AREA

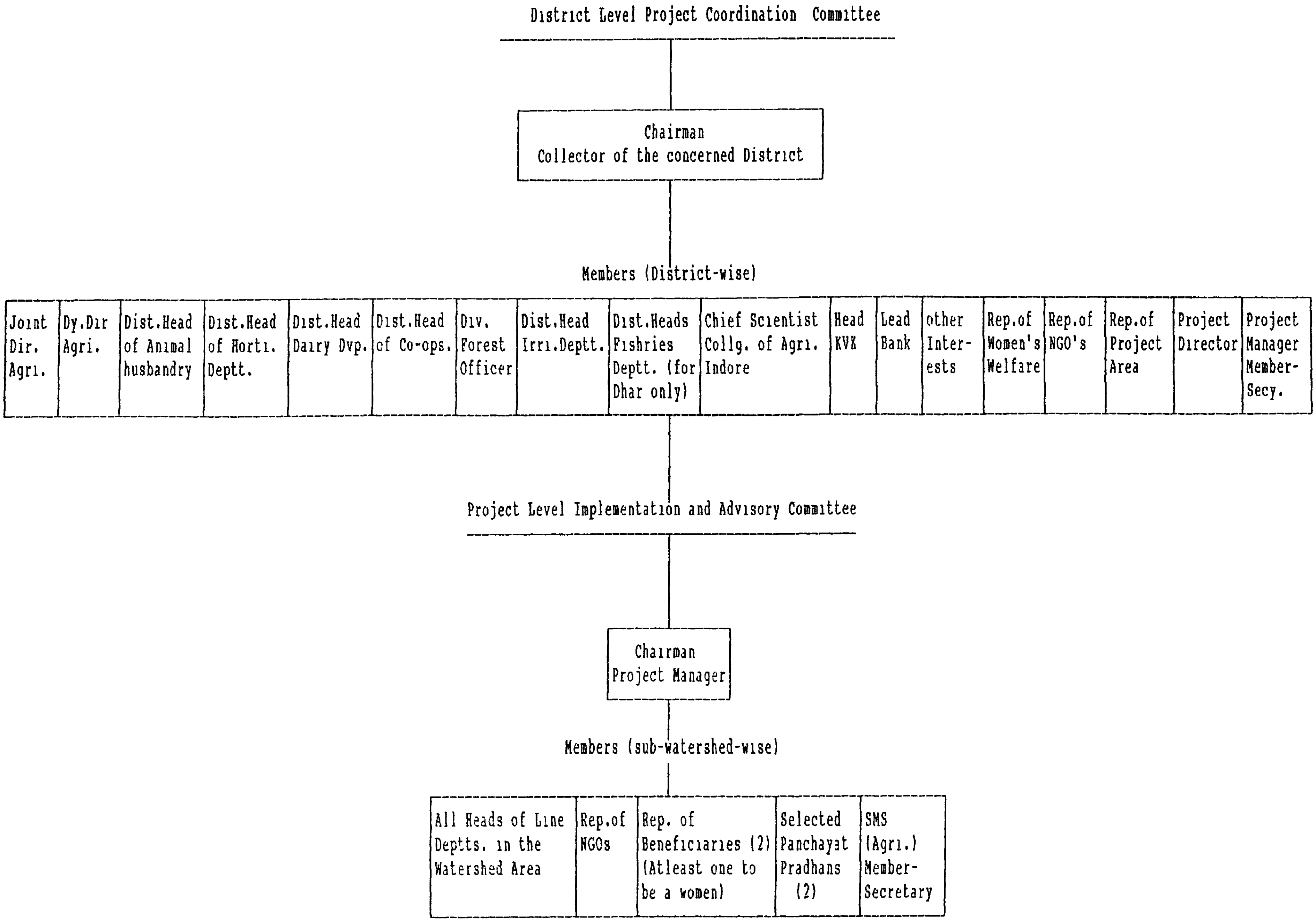
Name of the watershed	Year	Rainfall (mm)	Monthly Rainfall (mm)											
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Undwa Khal	1988	952												
(Ratlam)	1989	738												
	1990	1346												
	1991	952												
Bachawar	1985	474	-	-	-	-	-	31	78	291	21	53	-	-
(Dhar)	1986	474	-	-	-	-	-	31	78	291	20	3	-	-
	1987	591	-	-	-	-	-	57	91	412	5	10	3	14
Sarangi	1985	806	0.5	4.8	-	-	-	119	504	252	14	5	-	-
(Jhabua)	1986	494	-	-	-	-	-	119	504	252	14	5	-	-
	1987	857	47.0	-	-	-	-	61	105	569	60	15	-	-
	1988	1357	-	-	-	-	-	125	468	434	97	29	-	-
	1989	1044	-	-	-	-	-	432	245	455	112	-	-	-
	1990	1455	-	-	-	-	-	215	401	686	136	17	-	-

ANNEXURE X

PROPOSED ORGANOGRAM


State Level Project Steering Committee
Chairman
Agriculture Production Commissioner
Members
Divisional Commissioners (2)
Secretary (Agriculture)
Director (Agriculture)
Director (Horticulture)
Director (Animal husbandry)
Secretary (Forests)
PCCF
Registrar (Co-op. Societies
Director (Fishries)
Director Small Scale Indtrs.
Vice Chancellor SAU
Project Director Members & Secretary
Collectors of the respective Distts.
Rep. of NGOs
Rep.of project Area
Other Interests
Rep.of Govt. of India MOA
Rep. of DANIDA

ANNEXURE X (CONTINUED)


District Level Project Coordination Committee
Chairman
Collector of the concerned District
Members (District-wise)
Joint Dir. Agri.
Dy.Dir Agri.
Dist.Head of Animal husbandry
Dist.Head of Horti. Deptt.
Dist.Head Dairy Dvp.
Dist.Head of Co-ops.
Div. Forest Officer
Dist.Head Irri.Deptt.
Dist.Heads Fishries Deptt. (for Dhar only)
Chief Scientist Collg. of Agri. Indore
Head KVK
Lead Bank
other Inter-ests
Rep.of Women's Welfare
Rep.of NGO's
Rep.of Project Area
Project Director
Project Manager Member-Secy.
Project Level Implementation and Advisory Committee
Chairman
Project Manager
Members (sub-watershed-wise)
All Heads of Line Deptts. in the Watershed Area
Rep.of NGOs
Rep. of Beneficiaries (2) (Atleast one to be a women)
Selected Panchayat Pradhans (2)
SMS (Agri.) Member-Secretary

ANNEXURE XI

PROJECT IMPLEMENTATION

FLOW CHART

I
Agricultural Production Commissioner
Chairman
State Level Project Steering Committee

II
Project Director
Incharge of three Project Districts

III
District Collector
Chairman
District Level Project Coordination Committee

IV
Project Manager
Chairman
Project Level Implementation and Advisory Committee